

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
Common Multiple Connector, Item 410 ----- SV778872-24 (1)	2/2	410FM01A External leakage, coupled, oxygen. Failure, coupling O- seal bypass leakage, defective interfacing dynatube hose or hose fitting leakage.	END ITEM: Leakage of vehicle/ station oxygen supply to ambient. Unable to charge the PLSS primary O2 bottles if the leakage is excessive GFE INTERFACE: Excessive consumption of vehicle/ station oxygen. MISSION: Unable to use one EMU during IV activity if leakage is excessive. Terminate EVA CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - The coupled oxygen supply fitting has three potential external leakage paths. One path is blocked by a single static radial O-seal. The second leakage path contains a radial O-seal which slides axially along a sealing surface provided by the umbilical common connector plunger coupling and uncoupling. The O-ring seal design configurations, dimensions and rigidity of assembly provide squeeze under all loading conditions. The third leakage path is by a dynatube fitting joint at the flex hose to IEU connector oxygen elbow. These fittings are required to have a 32 micro-inch maximum circular lap surface finish to preclude leakage. B. Test - Component Acceptance: Air-Lock, Inc. ATP 9902-06 requires that at 1005 + 32 - 0 psig (N2), the maximum allowable leakage is 5.0 scc/hr, coupled. IPT: An external leakage test is performed at HSWL (after O2 Compatibility Cycle Test) with the oxygen line coupled. No visible leakage is allowed. PDA: IEU: Two oxygen circuit leakage tests are performed per EMU1-21-022. Before and after the Oxygen Compatibility Cycle Test, the multiple connector (with O2 line attached) is mated and pressurized with oxygen to 850-950 psia. Leakage must not exceed 30 scc/minute. SCU: Two oxygen circuit leakage tests are performed per SEMU-60-015. Before and after the Oxygen Compatibility Cycle Test, the multiple connector (with O2 line attached) is mated and pressurized with oxygen to 850-950 psia. Leakage must not exceed 30 scc/minute. Certification: Certified for a useful life of 15 years. C. Inspection - Air-Lock, Inc. visually inspects the umbilical half at final inspection. HS source inspection visually inspects the umbilical half at final inspection. D. Failure History - IEU: None. SCU: H-EMU-410-D001 99/12/90 - Excessive leakage of SCU-side MWC O2 port due to cracks in the Teflon impregnated hardcoat at the O-ring sealing surface. Leakage was initially masked by Braycote lubrication which effectively provided a fluid seal at the O2 port O-rings until the Braycote deteriorated over time. Per Call Task LSS-139, the O2 housing material was changed to Nitronic 60 to eliminate the hardcoat in new builds. Ref EC 163402-454-001. E. Ground Turnaround - IEU: Tested per FEMU-G-527, Oxygen Leak Test. SCU: Tested per FEMU-R-001, EMU checkout in Orbiter, V1103.02, Orbiter Oxygen

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		410FM01A		<p>System Functional check.</p> <p>F. Operational Use - Crew Response - Pre/Post-EVA: Use airlock panel 02 valve to isolate leak between 02 recharge operations.</p> <p>Special Training - Standard EMU training covers this failure mode.</p> <p>Operational Considerations - Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.</p>

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-410 SCU COMMON MULTIPLE CONNECTOR
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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